

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 14160-1PCT	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/US04/37850	International filing date (<i>day/month/year</i>) 12 November 2004 (12.11.2004)	(Earliest) Priority Date (<i>day/month/year</i>) 14 November 2003 (14.11.2003)
Applicant BIOVENTURES, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 6 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

a. With regard to the language, the international search was carried out on the basis of:



the international application in the language in which it was filed.



a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☒ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☒ Certain claims were found unsearchable (See Box No. II)

3. ☒ Unity of invention is lacking (See Box No. III)

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the drawings to be published with the abstract is Figure No. _____



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/37850

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:
- a. type of material
- ☒ a sequence listing
- ☐ table(s) related to the sequence listing
- b. format of material
- ☒ on paper
- ☒ in electronic form
- c. time of filing/furnishing
- ☒ contained in the international application as filed
- ☒ filed together with the international application in electronic form
- ☐ furnished subsequently to this Authority for the purposes of search
2. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/37850

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 9-16
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 1, 3-8, the SNP at position 2286
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest
- | | |
|--------------------------|---|
| <input type="checkbox"/> | The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee. |
| <input type="checkbox"/> | The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation. |
| <input type="checkbox"/> | No protest accompanied the payment of additional search fees. |

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/37850

A. CLASSIFICATION OF SUBJECT MATTER

IPC: C12Q 1/68(2006.01);C07H 21/02(2006.01),21/04(2006.01)

USPC: 435/6;536/23.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/6; 536/23.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Database Genbank, National Center for Biotechnology Information, National Library of Medicine, NIH (Bethesda, MD, USA) Accession number AF007424, March 1998 (nucleotides 226-242).	1
X	Database Genbank, National Center for Biotechnology Information, National Library of Medicine, NIH (Bethesda, MD, USA), Accession number AJ338955, July 2002 (nucleotides 532-548).	1

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

24 April 2006 (24.04.2006)

Date of mailing of the international search report

26 MAY 2006

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US

Commissioner for Patents

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/37850

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Groups 1-2, claim(s) 1, in part, drawn to an isolated polynucleotide comprising at least 17 contiguous nucleotides of SEQ ID NO: 1, comprising position 2285 and 2286, where position 2286 is a C (group 1), or 3281 and 3282 where position 3282 is a G (group 2).

Groups 3-9, claim(s) 2, in part, drawn to isolated genetic material that indicates the presence or absence of dyslexia wherein the material comprises a sufficient portion of SEQ ID NO: 1 comprising of one of 7 different haplotypes. Each group is directed to a different haplotype. Group 3 is directed to haplotype 1. Group 9 is directed to haplotype 7.

Groups 10-18, claim(s) 3-8, in part, drawn to a method of diagnosing dyslexia by analyzing genetic material from chromosome 5 for the presence of one of two polynucleotides from claim 1 (groups 10 and 11, group 10 is directed position 2286 is a C, and group 11 is directed to position 3282 is a G), or a haplotype of claim 2 (groups 12-18, group 12 is directed to haplotype 1, group 18 is directed to haplotype 7).

Groups 19-22, claim(s) 17 and 18, in part, drawn to a kit comprising primers of SEQ ID NOS 2-9. Each group is directed to a primer pair. Group 19 is directed to primer pair of SEQ ID NOS 2 and 3. Group 22 is directed to primer pair of SEQ ID NOS 8-9.

Groups 23-24, claim(s) 19-20, in part, drawn to cDNA, including SEQ ID NOS 12 or 13. Group 23 is directed to SEQ ID NO: 12, and Group 24 is directed to SEQ ID NO: 13.

The inventions listed as Groups 1-24 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the claims directed to genetic material comprising portions of SEQ ID NO: 1 containing different haplotypes encompasses an array of probes which comprises portions of SEQ ID NO: 1, including the specified polymorphic positions. Fodor (US Patent 6,582,908) teaches an array of all possible 10 mer nucleic acids, which reads on the genetic material of claim 2. Therefor, claim 2 does not represent a special technical feature over the prior art. Accordingly, the claims lack the same or corresponding special technical feature over the prior art. Additionally, the claims are directed to distinct haplotypes containing different polymorphic positions, or to structurally distinct oligomers (Groups 1 and 2), or to methods of diagnosing using these structurally distinct haplotypes or oligomers. The nucleic acids so encompassed lack the same or corresponding special technical feature due to the different structures, which do not contain a common structure related to function, encompassed by each polynucleotide. Additionally, Groups 19-22 encompass structurally distinct primers, and Groups 23-24 are drawn to structurally distinct cDNA sequences. Accordingly, these claims lack the same or corresponding special technical feature and lack unity of invention.

Claims 9-16 are improperly multiply dependent and cannot be searched. They will not be further treated.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/37850

Continuation of B. FIELDS SEARCHED Item 3:

GenEmbl, Geneseq, Issued US Patents, Published US applications, EST for sequences; Medline, Caplus
search term: oligomer search for SEQ ID NO: 1 covering positions 2285 and 2286, dyslexia, chromosome 5